COURSE DATA

DATA SUBJECT

Code: 46744
Name: Diversity and phylogeny of`plants and fungi
Cycle: Master's Degree
ECTS Credits: 3
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2266 - Master's Degree in Applied Palaeontology	Facultat de Ciències Biològiques	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2266 - Master's Degree in Applied Palaeontology	Advanced scientific training	ELECTIVES

COORDINATION

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SUMMARY

This course is designed as an educational complement and included in the module \\\"Basic training\\\" as an extension of training in the knowledge of organisms. The main groups of plants (cyanobacteria, algae, plants) and fungi are studied from an evolutionary perspective.

From the proposed domains of life and supergroups of organisms, a synthesis of plant diversity and fungi with a phylogenetic perspective is presented. The characteristics of the most important study groups and greater attention to the organization, reproductive aspects and ecology in those groups with higher occurrence and relevance in the fossil record will be provided.

Domain Bacteria: cyanobacteria, which form the basis of photosynthetic organisms being the origin of plastids of photosynthetic eukaryotes.

Within the domain Eucariaseveral supergroups are studied; Opistokonta where mushrooms are placed;

Chromalveotata of which coccolitophorids, brown algae and diatoms are included and Archaeplastidasupergroup comprising red algae, green, terrestrial plants. In vascular plants anatomy and morphology of the stems and leaves and reproductive structures mainly spores and pollen are the most abundant fossil record of terrestrial plants is studied.

To address all these contents in 28 hours students will have study material in addition to the recommended bibliography.

Most sessions are theoretical-practical in order to observe material of studied group; given the limited time representative species will be chosen in each case.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

There are no restrictions concerning engagement with other courses.

COMPETENCES / LEARNING OUTCOMES

2266 - Master's Degree in Applied Palaeontology

Access information tools from other areas of knowledge and use them appropriately.

Access the necessary information in the specific field of the subject (databases, scientific articles, etc.) and have sufficient judgement to interpret and use it.

Apply critical reasoning and argumentation based on rational criteria.

Apply science from a social and economic point of view, promoting the transfer of knowledge to society.

Apply the knowledge acquired and problem-solving abilities in new or unfamiliar situations within broader (or multidisciplinary) contexts related to the field of study.

Apply the research experience acquired to initiate the research phase of a PhD programme on biodiversity-related topics.

Apply the research experience acquired to tasks specific to the profession, both in the private sector and in public institutions.

Assess the need to complement their scientific, historical, language, IT, literature, social and human ethics education by attending lectures or courses and/or carrying out complementary activities, self-evaluating the contribution that these activities make to their overall education.

Assume an ethical commitment and sensitivity towards environmental problems and natural and cultural

heritage.

Collect, represent and analyse data for the interpretation and production of geological maps and/or other forms of representation (stratigraphic columns, geological cross-sections, etc.) with a view to their inclusion in reports, scientific publications or other outputs.

Communicate and popularise scientific ideas.

Communicate conclusions and the knowledge and rationale supporting them to specialised and non-specialised audiences clearly and unambiguously.

Continue the learning process in a manner that is largely self-directed or independent.

Demonstrate in-depth understanding of the historical nature of the evolutionary process, both in its aspects of unrepeatability and contingency and in those linked to the fulfilment of laws of nature of all kinds and, therefore, of necessity.

Demonstrate intellectual curiosity and encourage responsibility for one's own learning.

Have an in-depth knowledge and understanding of the nature of biodiversity and its ecosystemic relationships both now and in the past.

Integrate knowledge and confront the complexity of making judgements based on information that, although incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of knowledge and judgements.

Know, understand and draw conclusions, applicable to the present time, about the crises of biological diversity, and their causes and consequences within the framework of actualism.

Know and understand the palaeodiversity of living beings, their ecosystemic relationships and the palaeogeographical distribution achieved by the main groups of living beings throughout the Earth's history.

Make quick and effective decisions in complex situations in their professional or research work, by developing new and innovative work methodologies adapted to the scientific/research, technological or professional field in which they carry out their activity.

Plan and manage available resources, taking into account the basic principles of quality, risk prevention, safety and sustainability.

Prepare, write and present reports and projects in public in a clear and coherent manner, defend them with rigour and tolerance and respond satisfactorily to any criticism that may arise from the presentation.

Produce all types of reports related to palaeontological matters clearly and concisely at an official or professional level (reports, grants, heritage impact reports, research projects, etc.)

Skillfully handle the field, laboratory and office techniques for the extraction, preparation, cataloguing, digital reconstruction, study and dissemination of microfossils and macrofossils.

Understand the fundamental principles of facies analysis in continental, transitional and marine depositional systems, and the use of fossils for palaeoenvironmental interpretation of the stratigraphic record.

Understand the nature of the fossil record in relation to the sedimentary process, the biostratinomic and phosildiagenetic phases of the process and the mechanisms of fossilisation.

Understand the nature of the stratigraphic record, its discontinuities, cycles and events, the different types of sedimentary basins, the factors controlling their infilling, the resulting three-dimensional geometries and stratigraphic correlations.

Use acquired knowledge as a basis for originality in the development or application of ideas, often in a research context.

Work efficiently in a professional or research team, acquiring the ability to participate in research projects and scientific or technological collaborations.

DESCRIPTION OF CONTENTS

1. Introductory session

1-The Tree of Life and its supergroups: organisms performing oxygenic photosynthesis and fungi.

2. Prokaryotes, Domain Bacteria: Cyanobacteria.

3. Domain Eucarya: SupergroupOpistokonta: fungi, structure and diversity.

4. Supergroup S-A-R: haptophytes, diatoms and brown algae.

5. Supergroup Archaeplastida: Red algae. Green algae: Chlorophyta and Streptophyta.

6. Embryophytes: bryophytes.

7. Vascular plants: vegetative Organization

8. Lycophytes and pteridophytes

9. Seed plants: organization, reproduction, seed

10. Gimnosperms

11. Angiosperms: organization, anatomy, flower

12. Angiospermes: Pollen

13. Diversity of angiosperms

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	20,00
Laboratory	10,00
Total hours	**30,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	0,00
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**0,00**

TEACHING METHODOLOGY

Except Sessions 1 and 9 are 1 hour theoretical, the remaining 11 are theoretical/practical sessions of 2 hours. In t

Students should prepare a seminar in groups of 2-3 on topics related to the subject that are of interest.

EVALUATION

For the evaluation of the subject will be considered:

• Classes assistance 10 %

• Report of the labs and seminar 40 %

• Final test about the contents of the course 50 %

REFERENCES

- RAVEN, P.H.; EVERT, R.F. & S. E. EICHHORN (2005). 7ª ed. Biology of plants. W.H. Freeman and Company. New York, 686 pp. - SIMPSON, M. G. (2006). Plant Systematics. ElsevierAcademicPress, 590 pp. - CARRION, J. S. (2003) Evolución Vegetal. Ed. Diego Marín. pag. 497 - STRASBURGER, E. NOLL, F., SCHENCK, H & SCHIMPER, A. F. W. (2004). Tratado de Botánica. 35ª edición actualizada. Ed. Omega. Barcelona. 1231 pp - VARGAS, P. & R. ZARDOYA (Eds.) 2012. El árbol de la vida: sistemática y evolución de los seres vivos. Impulso Global Solutions, S.A. Madrid, 597 pp

- http://tolweb.org/tree/ [árbol de la vida]